PHASE DIFFERENCE PLATE, ELLIPTICALLY POLARIZING PLATE, SEPARATION ELEMENT FOR CIRCULARLY POLARIZED LIGHT AND LIQUID CRYSTAL DISPLAY DEVICE

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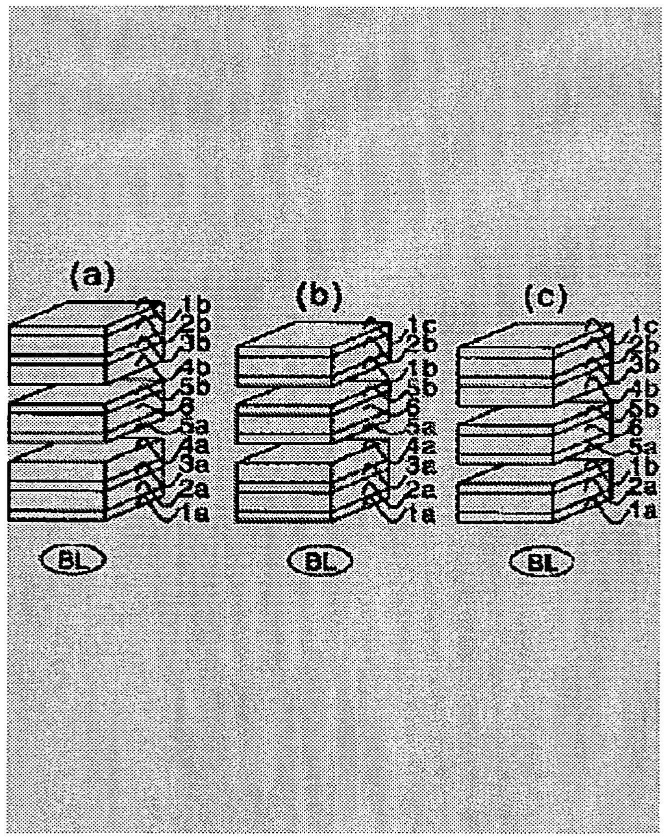
Abstract of **JP2001100036**

PROBLEM TO BE SOLVED: To provide a phase difference plate with which a liquid crystal cell can be accurately optically compensated even when the temperature and humidity change.
SOLUTION: The phase difference plate has an optical anisotropic layer formed from liquid crystal molecules on a transparent support. In the plate, the transparent support has 10 to 1,000 nm phase difference in the plane or thickness direction, and the absolute modulus of photoelasticity of the transparent support is controlled to <1 × 10-6 cm2/kg.



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(54) [Title of the invention] PHASE DIFFERENCE PLATE, ELLIPTICALLY POLARIZING PLATE, SEPARATION ELEMENT FOR CIRCULARLY POLARIZED LIGHT AND LIQUID CRYSTAL DISPLAY DEVICE

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[CLAIMS]

[Claim 1] A phase difference plate having an optically anisotropic layer of liquid crystal molecules formed on a transparent support, wherein the transparent support has a phase difference of 10 to 1000 nm in the in-plane or thickness direction and an absolute modulus of photoelasticity lower than 1×10^{-6} cm²/Kg.

[Claim 3] The phase difference plate according to claim 1, wherein the liquid crystal molecules are rod-like liquid crystal molecules aligned in a cholesteric manner, and the optically anisotropic layer has no selective absorption in a visible range.

[Claim 4] An elliptically polarizing plate comprising a polarizing film, a transparent support and an optically anisotropic layer of liquid crystal molecules, being laminated in this order, wherein the transparent support has a phase difference of 10 to1000 nm in the in-plane or thickness direction and an absolute modulus of photoelasticity lower than 1×10^{-6} cm²/Kg.

[Claim 5] A separation element for circularly polarized light, comprising a polarizing film, a transparent support and an optically anisotropic layer formed of rod-like liquid crystal molecules aligned in a cholesteric manner and having no selective absorption in a visible range, being laminated in this order, wherein the transparent support has a phase difference of 10 to 1000 nm in the in-plane or thickness direction and an absolute modulus of photoelasticity lower than 1×10^{-6} cm²/Kg.

[Claim 6] A transmission type liquid crystal display device comprising a first polarizing plate, a liquid crystal cell and a second polarizing plate laminated in this order,

wherein at least one of the polarizing plates comprises a polarizing film, a transparent support and an optically anisotropic layer formed of liquid crystal molecules, being laminated in this order when viewed from the outside of the

device, and the transparent support has a phase difference of 10 to 1000 nm in the in-plane or thickness direction and an absolute modulus of photoelasticity lower than 1×10^{-6} cm²/Kg.

[Claim 7] A liquid crystal display device comprising a backlight, a first polarizing plate, a liquid crystal cell and a second polarizing plate laminated in this order,

wherein the first polarizing plate comprises an optically anisotropic layer formed of rod-like liquid crystal molecules aligned in a cholesteric manner and having no selective absorption in a visible range, a transparent support and a polarizing film, being laminated in this order when viewed from the backlight side, and the transparent support has a phase difference of 10 to 1000 nm in the in-plane or thickness direction and an absolute modulus of photoelasticity lower than 1×10^{-6} cm²/Kg.